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EXAMINER	
ABDULSELAM, ABBAS I	

ART UNIT	PAPER NUMBER
2674	9

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/904,960	Applicant(s) KELLIS, JAMES T.	
	Examiner Abbas I Abdulselam	Art Unit 2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-11 and 15-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-11 and 15-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see 04/15/04, filed 04/15/04 with respect to the rejection(s)of claim(s) 2-11 and 15-19 under U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ando et al. (USPN 5986624).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita et al. (US Patent 6,222,323) in view of Hojabri et al. (US Patent 6,166,579) and Ando et al. (USPN 5986624).

As to claims 2, and 11,Yamashita et al. discloses an apparatus (matrix of light emitting elements organic EL column 1, lines 25-27) which provides a uniformly varying brightness control for a display screen, comprising: a brightness control device (brightness setter 10, column 7, lines 4-5, figure 8), a brightness control circuit (controller 9 coupled to brightness setter 10 as shown in figure 8) responsive to an analog input for providing an output current to the display screen (display section 6, column 4, et al. fails to teach a digital input representative of a state of the brightness control device. lines 59-60 , electric current, column 4, lines 53-54) so as to control brightness of said display screen (controller 9 controls anode controller 7 and cathode controller 8 based on brightness level B, column 8, lines 41-43).

However, Yamashita fails to teach a digital input representative of a state of the brightness control device.

Hojabri on the other hand teaches a digital input representative of a state of the brightness control device (digital input signal 47, column 4, lines 42-44, 6 bit Bias Brightness Control as shown in figure 6). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus of Yamashita et al. then operate the brightness control device corresponding a digital input signal as taught by Hojabri et al. to obtain the apparatus Yamashita et al. modified by Hojabri et al. because it would allow the user to control the brightness of the display apparatus with more accuracy.

However, Yamashita et al. fails to teach that the output current is exponentially related to the digital input.

Ando on the other hand teaches a field emission type cathode with characteristics as shown in FIG. 3, from which it may be seen that the relation between the driving voltage Vgk and the anode current Ia (field emission current) is not linear but exponential (col. 2, lines 40-47).
Therefore, it would have it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yamashita's display system to adapt Ando's characteristics of the field emission cathode as shown in Fig. 3. One would have been motivated in view of the suggestion in Ando that characteristics of the field emission cathode as plotted in Fig. 3 provides functional equivalence to desired "output current being exponentially related to the digital input". The use of field emission cathode helps function a display apparatus as taught by Ando.

As to claim 3, Ando teaches the digital input further comprises a plurality of digital inputs (Fig. 3 & Fig. 5).

As to claim 4, Ando teaches the output current further comprises a plurality of output currents (Fig. 5).

3. Claims 5- 10, 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita et al. in view of Hojabri et al. (US Patent 6,166,579), Ando et al. (USPN 5986624) and in further in view of Ahmed US Patent 4,417,240).

As to claims 5 and 9, Yamashita et al. teaches an apparatus (display device with matrix of light emitting elements organic EL column 1, lines 25-27) and associated method, which provides a uniformly-varying brightness control for a display screen, comprising: an input (external signal from keyboard, column 5, lines 1-2); a current mirror circuit connected to an LED array (current sources Jl-Jm shown in figure 5) so as to provide current to the LED array that is exponentially related to the digital input (Fig. 3 of Ando et al.).

However Yamashita et al. fails to teach, "an attenuator which receives the digital input and a reference voltage and provides an attenuated voltage output based n the digital input". Hojabri et al. teaches an attenuator (digitally controlled signal attenuator circuit, see Abstract, column 4, lines 16-17), which receives the digital input, and a reference voltage (DC reference voltage 17, column 3, lines 60-61) and provides an attenuated voltage output based on the digital input. It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus Yamashita et al. then add an attenuator circuit as taught by Hojabri et al. to obtain the apparatus modified by Hojabri et al; because it will help the operator to control brightness at different settings of attenuation. Note also Hojabri et al. teaches digital input signal varied in value in accordance with the desired brightness setting (column 4, lines 43-44). However, Yamashita modified by Hojabri et al. fails to teach a voltage-to-current converting amplifier circuit. Ahmed teaches a voltage-to-current converting amplifier circuit (column 3, lines 31-33). It would have been obvious to a person of ordinary skill in the art to utilize the apparatus Yamashita et al. modified by Hojabri et al. then couple a voltage-to-current

converting amplifier circuit as taught by Ahmed to obtain the apparatus Yamashita et al. modified by Hojabri et al. and Ahmed because it would allow proper driving of the aforementioned LED array; provide current to the LED array that is exponentially related to the digital input (Ando et al. Fig. 3 & Fig. 5).

As to claims 6 and 10, where the digital input further comprises a plurality of digital inputs (Hojabri et al., plurality of input signals, column 3, lines 11-12, 6 bits Bias Brightness controlled figures 4 and 6).

As to claim 7, wherein the current mirror circuit comprises a plurality of current mirror circuits (Yamashita: current sources J1 through Jm as shown in figure 5), each of said plurality of circuits connected to the LED array so as to provide current that is exponentially related to at least one of the plurality of digital inputs to a respective portion of the LED array (Ando's Fig. 3 and Fig. 5).

As to claim 8, Yamashita et al. modified by Hojabri et al. and Ahmed failed to teach an input trimming resistor network. However, trimming resistor network is well known in the art for obtaining a desired characteristic. It would have been obvious to a person of ordinary skill in the art to utilize the apparatus Yamashita et al. modified by Hojabri et al. and Ahmed then make use of trimming resistor network in order to obtain a desired resistance value.

As to claim 15, Yamashita et al. teaches an apparatus (display device with matrix of light emitting elements organic EL, column 1, lines 25-27) which provides a uniformly-varying brightness control for a display screen (display section 6, column 4, lines 59-60), comprising: means for applying a digital input to a circuit (external signal from keyboard, column 5, lines 1-2); means for providing at least one output current for controlling brightness of the display screen current source (J1 shown in figure 5 providing current to control brightness of display section), in response to the digital input, wherein the at least one output current is related to the digital input. However, Yamashita et al. fails to teach means for applying a reference voltage to a circuit, means for attenuating the reference voltage

based on the digital input. Hojabri et al. teaches means for applying a reference voltage to a circuit (DC reference voltage 17, column 3, lines 60-61), means for attenuating the reference voltage based on the digital input (digitally controlled resistive attenuator circuit, column 4, lines 17-18). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus Yamashita et al. then add an attenuator and a reference voltage as taught by Hojabri et al. to obtain the apparatus Yamashita et al. modified by Hojabri et al. because it would allow the operator to adjust brightness at different settings of attenuation. However, Yamashita et al. fails to teach means for converting the attenuated voltage to current. Ahmed teaches means for converting the attenuated voltage to current (voltage-to-current converter means, column 3, lines 28-37). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus Yamashita et al. modified by Hojabri et al. and then couple a voltage to-current converter means as taught by Ahmed to obtain the apparatus Yamashita et al. modified by Hojabri et al. and Ahmed because it would allow proper driving of the aforementioned LED array, wherein the at least one output current is exponentially related to the digital input (Ando et al. Fig. 3&5).

As to claim 16, an apparatus as defined in claim 15, wherein the means for providing at least one output current comprises means for providing a plurality of output currents (Yamashita et al. teaches controller 7 providing a plurality of current sources J1 through Jm shown in figure 6)

As to claim 17, an apparatus as defined in claim 16, wherein the means for applying a digital input comprises means for applying a plurality of digital inputs to the circuit (note Hojabri et al. teaches digitally controlled signal attenuator, see abstract, 6 bits Bias as shown in figure 6)

As to claim 18, an apparatus as defined in claim 17, wherein each of at least two of the plurality of digital inputs is related to at least one of at least two of the plurality of output currents (Yamashita et al. teaches two current sources J1/J2 shown in figure 5, also Hojabri et al. teaches 6 bits Bias as shown in figure 6).

As to claim 19, an apparatus as defined in claim 18, wherein each of the at least two of the plurality of output currents (see Yamashita et al., currents supplied to anode 2, column 5, lines 9-10, current sources J1 and J2 shown in figure 6) defines a control signal (signals of displaying data and characters on display 6, column 5, lines 4-5) which controls brightness of a different proportion of the display screen (different pixels comprising light emitting elements are illuminated in display section 6 shown in figure 6).

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following art is cited for further reference.

U.S. Pat. No. 6,690,839 to Ferguson

4. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Abbas Abdulselam** whose telephone number is **(703) 305-8591.** The examiner can normally be reached on Monday through Friday (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Richard Hjerpe**, can be reached at **(703) 305-4709.**

Any response to this action should be mailed to:

Commissioner of patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314

Hand delivered responses should be brought to Crystal Park II, Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology center 2600 customer Service office whose telephone number is (703) 306-0377.

Abbas Abdulselam

Examiner

Art Unit 2674

November 22, 2004

XIAO WU
PRIMARY EXAMINER